

Amendment Under 37 CFR 1.111
U.S. Application No. 10/009,822

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

1.-6. (canceled).

7. (previously presented): A method of producing a material for heat dissipation substrate for mounting a semiconductor chip, comprising the steps of:

press-forming molybdenum powder having an average particle size of 2-4 μ m at a pressure of 100-200 MPa to obtain a molybdenum powder compact;

impregnating melted copper into a void between powder particles of the molybdenum powder compact in a nonoxidizing atmosphere at 1200-1300°C to obtain a composite of molybdenum and copper which contains 70-60% molybdenum in weight ratio, the balance copper;

primary rolling the composite in one direction as a first rolling direction at a temperature of 100-300°C and at a working rate of 50% or more; and

secondary rolling the composite as cold rolling in a direction intersecting with the one direction as a second rolling direction at a working rate of 50% or more after the step of primary rolling,

wherein a total working rate is 75% or more when primary rolling and secondary rolling so as to produce a rolled composite of molybdenum and copper which has a coefficient of linear expansion of $8.2 \times 10^{-6}/K$ or less at 800°C in the second rolling direction.

8. (previously presented): A method as claimed in claim 7, wherein each of said steps of primary and secondary rolling is repeatedly carried out so as to extend particles of molybdenum contained in the composite to the first and the second rolling directions and form the particles into a flat shape.

9. (previously presented): A method as claimed in claim 7, further comprising the step of press-bonding copper plates to both surfaces of the rolled composite to obtain a substrate for a

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semiconductor-mounting heat dissipation substrate having a copper-clad, said substrate having a coefficient of linear expansion of $8.2 \times 10^{-6}/\text{K}$ or less at 800°C .

10. (previously presented): A method as claimed in claim 9, wherein said steps of primary rolling and secondary rolling the copper-molybdenum composite as an intermediate layer are carried out with the ratio of copper and molybdenum and a reduction percentage controlled so that a resultant rolled composite has a coefficient of linear expansion of $8.2 \times 10^{-6}/\text{K}$ or less at 800°C , and thereafter the step of press-bonding copper on both surfaces of the rolled composite is carried out to obtain a copper-clad rolled composite having a layer ratio of 1:4:1 of Cu/Cu-Mo composite/Cu and a coefficient of linear expansion of $8.2 \times 10^{-6}/\text{K}$ or less at 800°C .

11. (currently amended): A method as claimed in claim 9, wherein said steps of primary rolling and the secondary rolling the copper-molybdenum composite as an intermediate layer is carried out with the ratio of copper and molybdenum and a reduction percentage controlled so that a resultant rolled composite has a controlled coefficient of linear expansion to $8.2 \times 10^{-6}/\text{K}$ or less at 800°C , and thereafter said step of press bonding copper on both surfaces of the copper-molybdenum composite is repeatedly carried ~~carried~~ out at a predetermined reduction ratio to obtain a copper-clad rolled composite having a layer ratio controlled coefficient of linear expansion to $8.2 \times 10^{-6}/\text{K}$ or less at 800°C .

12. (currently amended) A method of producing a ceramic package, comprising:
press-forming molybdenum powder having an average particle size of $2\text{-}4\mu\text{m}$ at a pressure of 100-200 MPa to obtain a molybdenum powder compact;

impregnating melted copper into a void between powder particles of the molybdenum powder compact in a nonoxidizing atmosphere at $1200\text{-}1300^\circ\text{C}$ to obtain a copper-molybdenum composite containing 70-60% molybdenum in weight ratio, the balance copper; and

primary rolling the composite in one direction as a first rolling direction at a temperature of $100\text{-}300^\circ\text{C}$ and at a working rate of 50% or more;

secondary rolling the composite as cold rolling in a direction intersecting with the one direction as a second rolling direction at a working rate of 50% or more after the step of primary rolling to produce a rolled;

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press-bonding copper plates to both surfaces of the rolled composite to obtain a copper-clad rolled composite having a coefficient of linear expansion of $8.2 \times 10^{-6}/\text{K}$ or less at 800°C ; and directly brazing the copper-clad rolled composite with ceramic having a metal layer affixed to a surface of the ceramic.

13.-14. (canceled).

15. (currently amended): The method as claimed in claim 11, wherein said predetermined rate reduction ratio is approximately 10%.